

Abstract Submitted  
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**The NSTX-U Thomson scattering diagnostic system**<sup>1</sup> B.P. LEBLANC, A. DIALLO, H. FEDER, G. LABIK, D.R. STEVENS, R. UPCAVAGE, PPPL — The NSTX-U upgrade consists primarily of two elements: (1) a new Center Stack (CS) of larger diameter, doubling of the toroidal field ( $\leq 1\text{T}$ ) and quintupling the flat-top duration; (2) a second Neutral Beam Injector (NBI) doubling the NBI heating and current drive power. These two hardware modifications necessitate rerouting the laser beam path of the Multi-Point Thomson Scattering (MPTS) diagnostic: (1) In order to avoid ablating the CS tile material, the laser beam path has been re-aimed to a larger tangency radius; (2) Since a straight unobstructed laser-beam escape route is precluded by the presence of the new NBI box, a multi-mirror arrangement is being designed. Since it is unpractical to relocate the mirror collection optics to a different machine port, the new laser beam path has been kept as close as possible to the original route. Ray-tracing calculations complemented with in-situ test of principle verification have shown that the original collection optics can be reconfigured to image the new laser beam path with acceptable resolution. The NSTX-U MPTS system will benefit from a recent upgrade to 42 radial channels and will continue using two 30-Hz Nd:YAG lasers, although the laser input and exit flight tubes will be given a larger bore in order to permit a straightforward addition of a third laser beam. Progress report will be given of this continuing work.

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